

# **Advantage ICF PIB 214**

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## **Advantage ICF System - 2012 BCBC Energy Efficiency Requirements**

# Advantage ICF System® Product Information Bulletin

## Advantage ICF System - 2012 BCBC Energy Efficiency Requirements

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The **Advantage ICF System**® is an energy efficient insulating concrete forming (ICF) system used consisting of a continuous layer of expanded polystyrene (EPS) insulation over the interior and exterior face of a solid concrete core. This bulletin provides examples of typical **Advantage ICF System** wall assemblies for above and below grade applications that meet the requirements of the 2012 British Columbia Building Code (2012 BCBC).

**Advantage ICF System** walls do not use wood framing so the interior and exterior EPS insulation panels are continuous versus wood frame assemblies which are constructed with wood studs at 406 mm (16") to 610 mm (24") on center. Energy efficiency requirements in 2012 BCBC, Subsection 9.36.2. are based upon minimum **effective thermal resistance (RSI<sub>eff</sub>/R<sub>eff</sub>)** of building assemblies which includes the effect of thermal bridging due to repetitive structural members such as wood framing in wall assemblies calculated using the formula below.

$$RSI_{eff} (R_{eff}) = \frac{100\%}{\frac{\% \text{ Area of Framing}}{RSI_F(R_F)} + \frac{\% \text{ Area of Cavity}}{RSI_C(R_C)}} + RSI(R) \text{ Continuous Material Layers}$$

Since the **Advantage ICF System** consists of a monolithic concrete core with continuous insulation on the interior and exterior faces, there is no framing or cavity insulation calculation and the **minimum effective thermal resistance** need only include the calculation for the continuous layers. Table 1 provides **RSI<sub>eff</sub> (R<sub>eff</sub>)** for **Advantage ICF System** above-grade and below-grade wall applications.

**Table 1 – RSI<sub>eff</sub> (R<sub>eff</sub>) for Advantage ICF Wall Assemblies**

Above-Grade Wall Components	RSI <sub>eff</sub>	Below-Grade Foundation Components	RSI <sub>eff</sub>
Outside Air Film	0.03		
Metal Siding	0.11		
<b>Type 2 EPS Insulation</b>	<b>1.87</b>	<b>Type 2 EPS Insulation</b>	<b>1.87</b>
152-mm Concrete Wall	0.06	152-mm Concrete Wall	0.06
<b>Type 2 EPS Insulation</b>	<b>1.87</b>	<b>Type 2 EPS Insulation</b>	<b>1.87</b>
13-mm Gypsum Wall Board	0.08	13-mm Gypsum Wall Board	0.08
Inside Air Film	0.12	Inside Air Film	0.12
<b>RSI<sub>eff</sub> (R<sub>eff</sub>)</b>	<b>4.14 (23.5)</b>	<b>RSI<sub>eff</sub> (R<sub>eff</sub>)</b>	<b>4.00 (R-22.7)</b>

Table 2 provides **minimum effective thermal resistance** per 2012 BCBC, Tables 9.36.2.6.A. and 9.36.2.6.B. for above grade wall assemblies and Tables 9.36.2.8.A. and 9.36.2.8.B. for below-grade walls.

**Table 2 - Minimum Effective Thermal Resistance for Wall Assemblies per 2012 BCBC**

Climate Zones	Zone 4	Zone 5	Zone 6	Zone 7A	Zone 7B	Zone 8
Heating Degree-Days (HDD) Celsius Degree-Days	< 3,000	3,000 to 3,999	4,000 to 4,999	5,000 to 5,999	6,000 to 6,999	≥ 7,000
<b>Above-Grade Walls</b>						
<b>Table 9.36.2.6.A. - Buildings Where a Heat Recovery Ventilator (HRV) is not Installed</b>						
<b>RSI<sub>eff</sub></b> <b>(R<sub>eff</sub>)</b>	2.78 (15.8)	3.08 (17.5)	3.08 (17.5)	3.08 (17.5)	3.85 (21.9)	3.85 (21.9)
<b>Table 9.36.2.6.B. - Buildings Where a Heat Recovery Ventilator (HRV) is Installed</b>						
<b>RSI<sub>eff</sub></b> <b>(R<sub>eff</sub>)</b>	2.78 (15.8)	2.97 (16.9)	2.97 (16.9)	2.97 (16.9)	3.08 (17.5)	3.08 (17.5)
<b>Below-Grade Foundations</b>						
<b>Table 9.36.2.8.A. - Buildings Where a Heat Recovery Ventilator (HRV) is not Installed</b>						
<b>RSI<sub>eff</sub></b> <b>(R<sub>eff</sub>)</b>	1.99 (11.3)	2.98 (16.9)	2.98 (16.9)	3.46 (20.0)	3.46 (20.0)	3.97 (22.5)
<b>Table 9.36.2.8.B. - Buildings Where a Heat Recovery Ventilator (HRV) is Installed</b>						
<b>RSI<sub>eff</sub></b> <b>(R<sub>eff</sub>)</b>	1.99 (11.3)	2.98 (16.9)	2.98 (16.9)	2.98 (16.9)	2.98 (16.9)	2.98 (16.9)

The **Advantage ICF System** wall assemblies in Table 1 exceed the **minimum effective thermal resistance** requirements per 2012 BCBC for all climate zones for both above-grade wall and below-grade foundation applications.